

11. [10 points]

a. [5 points] Compute the improper integral $\int_0^1 \ln(x) dx$. Show your work.

b. [5 points] Use comparison of improper integrals to determine if the improper integral $\int_1^{\infty} \frac{\sin(x) + 3}{x^2 + 2}$ converges or diverges. Show your work.